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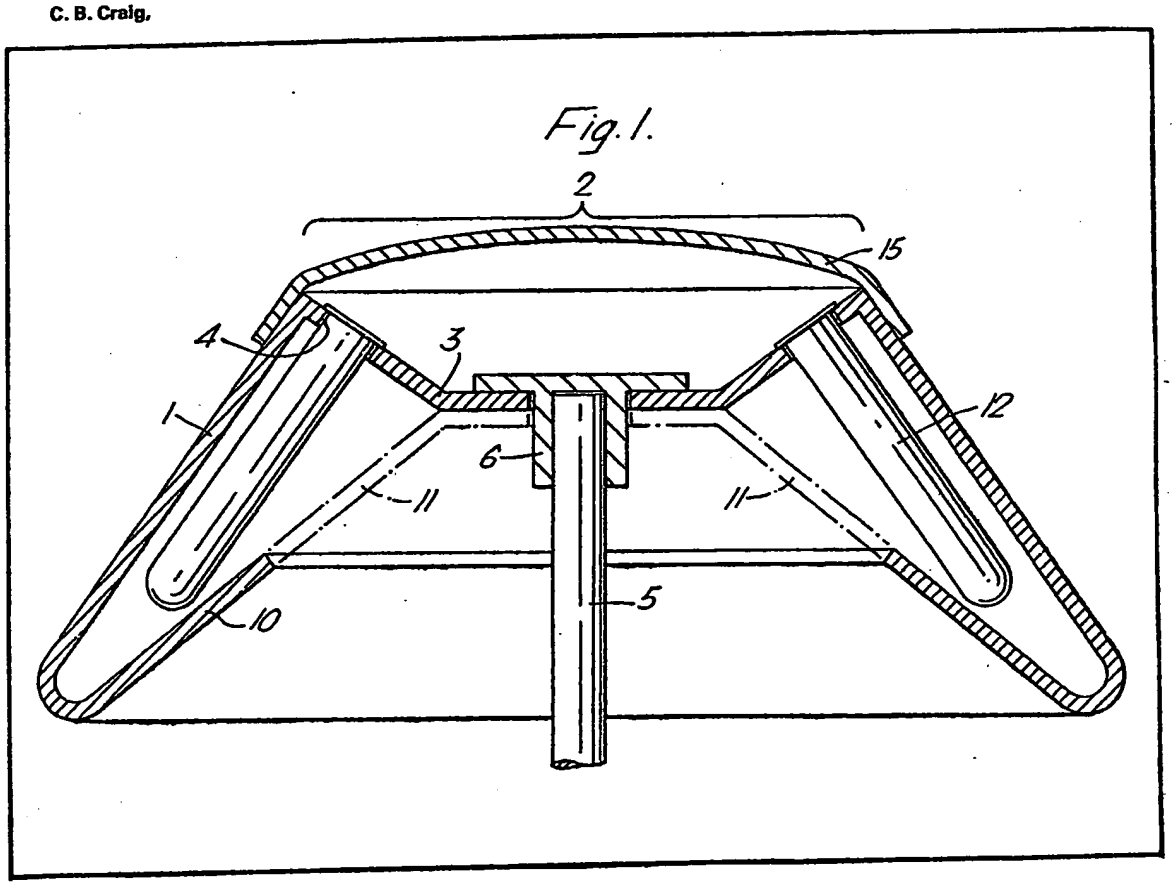
(71) Applicant
Fisons plc
Fison House
Princess Street
Ipswich
IP1 1QH
(72) Inventors
Robert Anthony Kerby
Kenneth John Napier
(74) Agents
Fisons plc
C. B. Craig,
12 Derby Road,
Loughborough,
Leics.

(54) **Centrifuge rotor**

(57) A hollow rotor for a centrifuge is in the form of a generally frusto conical member (1) having at its narrower end a transverse wall (3) provided with an aperture (4) adapted to receive a container (12) to be centrifuged, the broader end of the frusto conical member being returned on itself to form an outer or, as shown, an inner wall (10) extending in spaced relation to at least part of the frusto conical member.

Fig. 1.



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The references to Figure 2 of the drawings in the printed specification are to be treated as omitted under Section 15(2) of the Patents Act 1977.

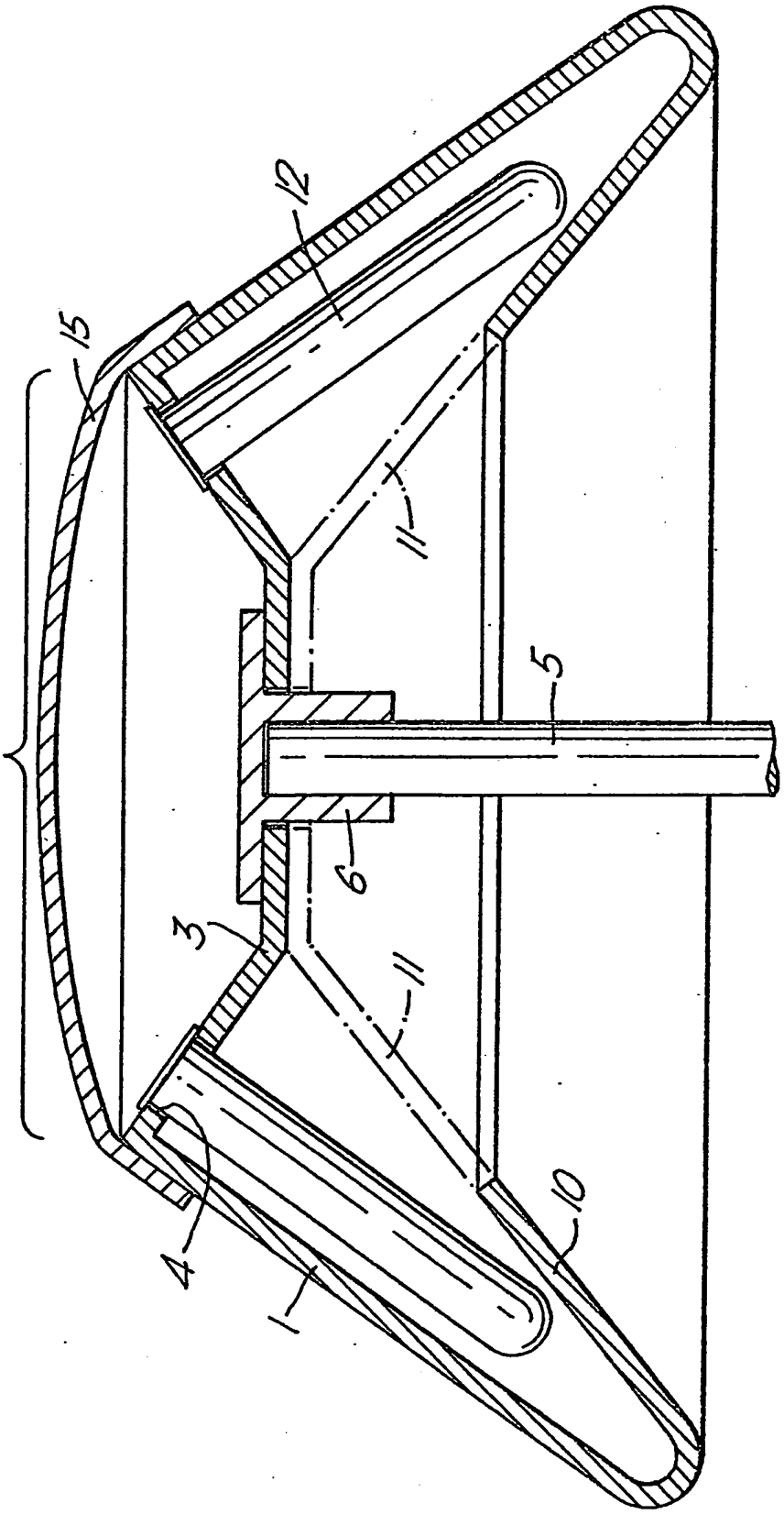

Fig. 1.

SPECIFICATION

Rotor

The present invention relates to a centrifuge rotor.

The present invention provides a hollow centrifuge rotor in the form of a generally frusto conical member having a transverse end wall at its narrower end and having an aperture adapted to receive a container to be centrifuged, the broader end of the frusto conical member being returned on itself to form a double skin to at least part of the frusto conical member.

For convenience the invention will now be described with respect to a preferred form of a rotor of the invention shown in the accompanying drawings which are vertical sections through two embodiments of the rotor.

In Figure 1, the rotor comprises an outer frusto conical skin member 1. This is conveniently formed from metal, e.g. aluminium or other suitable material, e.g. plastics. The member 1 has its narrower end 2 substantially closed by an end wall 3 which is conveniently formed integrally with member 1. Wall 3 is cut by a number of apertures 4 substantially symmetrically disposed radially about the axis of the member 1. These apertures 4 are of any suitable size and number to receive sample tubes to be centrifuged. The wall 3 is provided with means for mounting member 1 upon a shaft 5 substantially co-axially with the shaft. This means can be in the form of a bush or other mounting 6 bolted or otherwise fixed to the wall 3 and into which the end of shaft 5 engages. Alternatively, the central portion of wall 3 can be formed with an integral sleeve into which shaft 5 is mounted. Shaft 5 is driven by suitable means, e.g. an electric motor, either directly or indirectly.

In the rotor of Figure 1 the broad end of member 1 is returned upon itself to form a second, internal wall 10 within member 1. This wall 10 can be formed to lie substantially parallel to but at a distance, e.g. 0.5 to 2 cms, from wall 1. Alternatively, wall 10 can form a frusto conical surface having an included angle greater than that of member 1 so as to form an annular V cross sectioned space between member 1 and wall 10.

Wall 10 is formed integrally with member 1 and from the same material so as to provide a unitary construction with member 1. Wall 10 can extend within member 1 until it abuts wall 3 or can, as shown, extend for only part of the length of member 1. In the latter case, a separate frusto conical piece 11 (shown dotted in the drawing) may be affixed (e.g. by suitable screws or nuts and bolts) to walls 3 and 10 to extend wall 10 to wall 3 and yet permit access into the tube space within the rotor. However, it is preferred that the wall 10 extend at least sufficient distance to form a well of sufficient capacity to contain all the contents of the tubes to be centrifuged at any one time in the rotor so that spillages are retained within the rotor.

It is especially preferred to form the rotor comprising wall 3, member 1 and the wall 10 by spinning aluminium to provide a light weight unitary construction.

Wall 10 acts to form a windshield to the under surface of member 1 and the sample tubes 12 mounted in the apertures in wall 3, thus reducing drag due to the exposed tubes. Also, should a tube 12 break or leak, the contents thereof will be caught in the annular space or well between wall 10 and member 1. With earlier forms of rotor the contents of the tube were not caught and escaped into other parts of the centrifuge. Walls 1 and 10 can be so designed that they provide at least partial support for the tubes mounted in the rotor. Also, if desired a cover 15 can be mounted on the rotor to seal the rotor during use, notably where noxious material, e.g. harmful bacteria, are being centrifuged.

In the rotor shown in Figure 2, the wall 1 has been returned externally on itself to form an external second wall 20. A second transverse end wall 21 is mounted on shaft 5 and co-operates with wall 20 to close the space between walls 1 and 20. Wall 21 is provided with a series of radially spaced apertures to receive sample tubes which extend into the space between walls 1 and 20. Wall 21 is preferably removably mounted so that it can be readily removed and exchanged for another wall having different sizes/spaces/numbers of tube holes therein. Again, the rotor of Figure 2 can be provided with a cover (not shown).

Claims

1. A hollow centrifuge rotor in the form of a generally frusto conical member having a transverse wall at its narrower end and having an aperture adapted to receive a container to be centrifuged, the broader end of the frusto conical member being returned on itself to form a double skin to at least part of the frusto conical member.

2. A hollow centrifuge rotor as claimed in Claim 1 in which the walls of the frusto conical member including the transverse wall are formed of spun aluminium.

3. A hollow centrifuge rotor as claimed in Claim 1 or Claim 2 in which the broader end of the frusto conical member is returned upon itself to form a second internal wall substantially parallel to but at a distance from the first wall.

4. A hollow centrifuge rotor as claimed in Claim 1 or Claim 2 in which the broader end of the frusto conical member is returned upon itself to form a second internal wall forming a frusto conical surface having an included angle greater than that of the first wall so as to form an annular V cross sectioned space between the first and second walls.

5. A hollow centrifuge rotor as claimed in Claim 3 or Claim 4 in which the second internal wall is extended until it abuts the transverse wall at the narrower end of the rotor.

6. A hollow centrifuge rotor as claimed in Claim 1 or Claim 2 in which the broader end of the frusto conical member is returned upon itself

to form a second external wall substantially parallel to but at a distance from the first wall.

7. A hollow centrifuge rotor as claimed in Claim 1 or Claim 2 in which the broader end of the frusto conical member is returned upon itself to form a second external wall forming a frusto conical surface having an included angle less than that of the first wall so as to form an annular V cross sectioned space between the first and second walls.

8. A hollow centrifuge rotor as claimed in Claim 6 or Claim 7 which comprises means for the attachment at the narrower end of the rotor of a second transverse wall provided with a series of radially spaced apertures adopted to receive sample tubes and wherein the space between the first and second walls is adapted to receive the sample tubes.

9. A hollow centrifuge rotor as claimed in Claim 8 in which the second transverse wall is detachable.

10. A hollow centrifuge rotor as hereinbefore described and as shown in the accompanying drawings.

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